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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/973,209

10/09/2001

Winston Z. Ho

5806

26588

7590

10/19/2004

LIU & LIU

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EXAMINER

YU, MELANIE J

ART UNIT

PAPER NUMBER

1641

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/973,209

**Applicant(s)**

HO, WINSTON Z.

**Examiner**

Melanie Yu

**Art Unit**

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/19/04, 6/21/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The preliminary amendment filed 16 September 2004 has been received. Claims 3-6 and 8-11 have been amended and claims 12-20 have been withdrawn. Claims 1-20 are pending.

#### ***Priority***

1. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date for claim 2, under 35 U.S.C. 120 as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application); the disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1 part (c) it is unclear how fluids are transported through microfluidic channels.

4. In Claim 2 the phrase "serpent-like structure" is vague and indefinite because it is unclear what is intended to be serpent-like and if all channels must not include sharp angles.

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5. Claim 3 is vague and indefinite because it is unclear if the given dimension is the width, height or total cross-sectional area of the channels.

6. Claim 4 is vague and indefinite because it is unclear if the microfluidic channels connect chambers containing at least one sample source and at least one reagent solution or whether the channels connect the sample and reagent fluids.

7. Claim 6 is vague and indefinite because it is unclear if the biological probes are immobilized on only magnetic beads, only a reaction zone, or both, and it is unclear how the external magnet is provided from magnet sources.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 3, 4, 6, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nelson et al. (US patent 6,007,690).

Nelson et al. teach a method for performing a biological assay in a microfluidic biochip platform comprising the steps of: providing a plurality of microfluidic channels with a constant cross-section area (col. 4, lines 9-24 and 36-42) and comprising at least one sample source and at least one reagent solution, wherein a portion of said microfluidic channels is connected to said at least one sample source and to at least one reagent solution (col. 16, lines 11-19); immobilizing

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at least one biological probe on said reaction zone (col. 7, lines 49-57); and transporting fluid in said microfluidic channels to said reaction zone, a portion of said fluid reacting with said at least one probe, wherein said reaction volume is product of said cross-section area multiplied with the length of said microfluidic channels having said at least one biological probe ("enriched channel"; col. 5, lines 3-11; col. 4, lines 43-50; col. 7, lines 39-49), wherein the dimension of the cross section is between 1  $\mu\text{m}$  and 200  $\mu\text{m}$ , which encompasses the recited 0.5  $\mu\text{m}$  and 2 mm.

Nelson et al. also teach the method further comprising the steps of: immobilizing at least one biological probe on magnetic beads (col. 5, lines 50-65); transporting said magnetic beads through said microfluidic channels (col. 21, lines 54-67); providing at least one external magnet from magnet sources beneath said reaction zone; and switching on said at least one external magnet to trap said magnetic beads (col. 6, lines 61-66). Nelson et al. also teach the probe being a protein (col. 8, lines 1-7), a nucleic acid (col. 22, lines 64-67), or a biological cell (col. 6, lines 14-29).

10. Claims 1-5, 7, 9, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Anderson et al. (US patent 6,168,948).

Anderson et al. teach a method for performing a biological assay in a microfluidic biochip platform comprising the steps of: providing a plurality of microfluidic channels in a serpent-like structure (Fig. 11D, channels 1256 and 1260) with a constant cross-section area (col. 5, lines 56-60; col. 18, lines 30-38) and comprising at least one sample source and at least one reagent solution, wherein a portion of said microfluidic channels is connected to said at least one sample source and to at least one reagent solution (col. 6, lines 10-30); immobilizing at least one biological probe on said reaction zone (col. 8, lines 26-42), wherein the probe is a nucleic acid

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(col. 8, lines 28-34); and transporting fluid in said microfluidic channels to said reaction zone, a portion of said fluid reacting with said at least one probe, wherein said reaction volume is product of said cross-section area multiplied with the length of said microfluidic channels having said at least one biological probe (col. 5, lines 51-60), wherein the width dimension is between 10  $\mu\text{m}$  and 100  $\mu\text{m}$  and the depth dimension is between 1  $\mu\text{m}$  and 500  $\mu\text{m}$  (col. 18, lines 30-38), which encompasses the recited 0.5  $\mu\text{m}$  and 2 mm. Anderson et al. teach the movement of fluid through microfluidic channels by a pressurizing mechanism for providing a forward-moving fluid (col. 25, lines 29-40). Anderson et al. also teach the method wherein the biochip platform further comprising, at least one biological probe immobilized on said reaction zone of a base plate; the microfluidic channels patterned on a bottom surface of a top plate; and the top plate coupled on top of the base plate (col. 56, lines 46-67; col. 57, lines 1-4). Anderson et al. also teach the step of detecting a reaction the reaction zone (col. 60, lines 21-47).

### ***Conclusion***

No claims are allowed.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Weigl et al. (US patent 5,972,710) teach a method comprising: providing a plurality of "serpent-like" structured microfluidic channels, immobilizing at least one biological probe, and transporting fluid in the microfluidic channels, but fail to teach the use of magnetic particles. Kiel et al. (US patent 6,303,316) teach the attachment of ligands on magnetic beads and microfluidic channels, but fail to teach the microfluidic channels being serpent-like.

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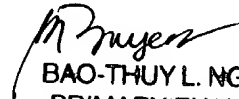
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Melanie Yu  
Patent Examiner  
Art Unit 1641



BAO-THUY L. NGUYEN  
PRIMARY EXAMINER  
10/15/04